CLAIMS:

1. In a vehicle differential including a housing having two spaced apart bearing seats that are aligned along an axis, a carrier in the housing generally between the bearing seats and having stub shafts which project into the bearing seats, and a beveled ring gear on the carrier; an improved bearing arrangement for supporting the carrier in the housing, said bearing arrangement comprising:

an internal helix in each bearing seat; and

a bearing located within each bearing seat and around the stub shaft that projects into the seat to enable the carrier and ring gear to rotate in the housing about the axis, each bearing including an outer race having an outer raceway that is presented inwardly toward and is inclined with respect to the axis and an external helix that is coupled with the internal helix of the ring seat in which the bearing is located, each bearing also including an inner raceway located around the stub shaft that projects into the bearing seat for that bearing where it is presented outwardly toward the raceway of the outer race and is inclined in the same direction as the outer raceway for the outer race, each bearing further including rolling elements located between and contacting the outer and inner raceways, the raceways of the one bearing being inclined in a direction opposite from the direction in which the raceways of the other bearing are inclined, so that the bearings confine the carrier axially in the housing,

whereby the setting of the bearings and the position of the ring gear

along the axis can be adjusted by rotating the outer races in their respective bearing seats.

2. The combination according to claim 1 wherein each bearing further includes a locking ring attached to its outer race and engaged with the housing such that it and the outer race to which it is attached cannot rotate in the bearing seat for the bearing.

3. The combination according to claim 1 wherein the raceways for each bearing are inclined downwardly away from the carrier, whereby the bearings are directly mounted.

4. The combination according to claim 1 wherein the outer race of each bearing also has a cylindrical surface located adjacent to the external helix on that race and likewise presented outwardly away from the axis.

5. The combination according to claim 4 wherein the external helix is at the end of the outer race where the raceway for the outer race has its smaller diameter and the cylindrical surface is at the end where the raceway has its larger diameter.

6. The combination according to claim 4 wherein the wherein the helices engage internal and external threads in the ring seats and on the outer races, respectively; and wherein the crests of the external threads on the outer race project outwardly beyond the cylindrical surface of that race.

7. The combination according to claim 6 wherein the cylindrical surface of each race lies along the internal threads of the bearing seat for the bearing of which that race is a part.

8. The combination according to claim 7 wherein each outer race is located in its bearing seat with a loose fit, and the external thread on that race engages the internal thread of the bearing seat with a fit that is more loose than the fit between the cylindrical surface and the internal thread.

9. The combination according to claim 4 wherein the helices are engaged with internal and external threads in the bearing seats and on the outer races, respectively, and wherein each outer race is located in its bearing seat with a loose fit, and the external thread on that race engages the internal thread of the bearing seat with a fit that is more loose than the fit between the cylindrical surface and the bearing seat.

10. The combination according to claim 4 wherein the helices are engaged with internal and external threads in the bearing seats and on the outer races, respectively, each bearing seat includes a half bore and an initially separate cap that fits over the half bore, and the internal thread for the seat is in the half bore and in the cap.

11. The combination according to claim 1 wherein each bearing further includes a ring which is attached to its outer race and has at least one formation which enables a tool to engage the ring, so that the tool can rotate the ring and the outer race.

12. The combination according to claim 11 wherein each ring is attached to its outer race with pins which extend through the ring and are lodged in holes in the outer race.

13. The combination according to claim 11 wherein each ring is attached to its outer race with a weld.

14. The combination according to claim 11 wherein each ring is attached to its outer race with an adhesive.

15. The combination according to claim 11 wherein each ring is attached to its outer race with screws which pass through the ring and thread into the outer race.

16. In a differential for an automotive vehicle, which differential includes: a housing having two spaced apart bearing seats that are aligned along an axis;

a carrier located in the housing generally between the bearing seats and having stub shafts which project into the bearing seats;

a beveled ring gear on the carrier; and

a single row tapered roller bearing supporting the carrier in the housing at each of the stub shafts such that the carrier can rotate about the axis, but is confined axially, each bearing including a cup located in the bearing seat for its bearing and having a tapered raceway presented inwardly toward the axis, a cone located around the stub shaft that projects into the seat and having a tapered raceway that is presented outward away from the axis and toward the raceway of the outer race, and tapered rollers arranged in a single row between the cup and cone and contacting the raceways of the cup and cone; the bearings being mounted in opposition so that the raceways of the one bearing taper downwardly in

one direction and the raceways of the other bearing taper downwardly in the opposite direction,

the improvement comprising:

an internal thread in each bearing seat, and

an external thread on the cup of each bearing, with the external thread engaging the internal thread of the bearing seat in which the cup is located,

whereby the setting of the bearings and the axial position of the ring gear can be adjusted by rotating the cups.

17. The improvement according to claim 16 wherein the cup of each bearing also includes a cylindrical surface which is generally smooth and is located adjacent to the external thread for the cup where the cylindrical surface is also presented outwardly away from the axis.

18. The improvement according to claim 17 wherein the cylindrical surface for each cup lies along the internal threads for the bearing seat in which the cup is located.

19. The improvement according to claim 18 wherein each cup is located in its bearing seat with a loose fit, and the external thread of the cup engages the internal thread of the bearing seat with a fit that is more loose than the fit between the cylindrical surface and the internal thread.

20. The improvement according to claim 17 wherein each cup is located in its bearing seat with a loose fit, and the external thread of the cup

engages the internal thread of the bearing seat with a fit that is more loose than the fit between the cylindrical surface and the bearing seat.

21. The improvement according to claim 17 wherein each cup fits into its ring seat with a loose fit in which the difference between the diameters of the pitch diameters for the external thread of the cup and the internal thread of the ring seat exceeds the difference between the diameter of the cylindrical surface and the surrounding surface of the bearing seat.

22. The improvement according to claim 17 wherein the bearings are mounted with the large ends of the tapered rollers in the one bearing presented toward the large ends of the rollers in the other bearing and vice versa.

23. The improvement according to claim 17, wherein each bearing seat includes a half bore in the housing and an initially separate cap located over the half bore, and the internal thread for the bearing seat is in the half bore and in the cap.

24. The improvement according to claim 16 and further comprising a locking ring attached to each cup and being engagable with the housing to prevent the cup from rotating within the housing.

25. The improvement according to claim 24 wherein the cup of each bearing has axially directed holes which open out of an end of the cup and the locking ring has pins which fit tightly into the holes.

26. The improvement according to claim 23 wherein the locking ring is a metal stamping, has formations that are engageable by the tool, and is deformed into engagement with the housing.

27. The improvement according to claim 16 wherein the cup of each bearing has a back face at the small end of its raceway, with the back face being located at substantiated angles with respect to the raceway of the cup and to the axis; and wherein each bearing further comprises a ring attached to its cup along the back face of the cup, the ring having at least one formation which enables a tool to engage the ring, so that the tool can rotate the ring and the cup.

28. For use in a differential for an automotive vehicle, the combination comprising:

a cup having an axis and including an external thread, a raceway presented inwardly toward the axis, and a back face at the small end of the raceway, where it is located at substantial angles with respect to the raceway and the axis;

and a ring attached to the cup at the back face of the cup, the ring having formations which enable it to be engaged by a tool, so that the ring and the cup can be rotated by the tool.

29. The combination according to claim 28 wherein the back face of the cup is perpendicular to the axis.

30. The combination according to claim 28 wherein the ring is formed from a material which may be deformed into engagement with a housing, so that the ring and cup can be locked against rotation in the housing.